Number One Air Conditioning Maker

Carrier

Division of Carrier Corporation

Carrier Parkway • Syracuse N Y 13221

Installation Instructions

38CQ, HQ, RQ

Accessory Optimizer Control

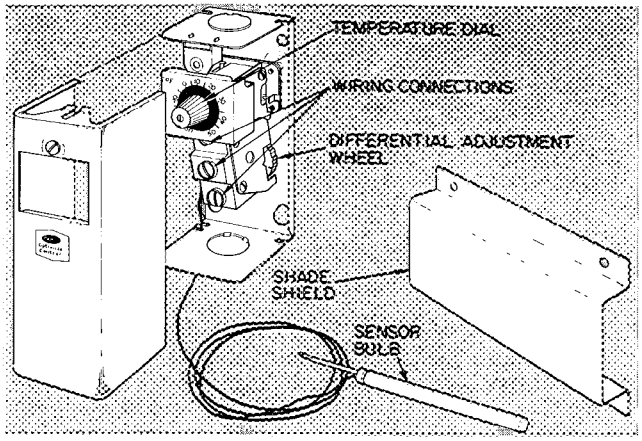

Fig. 1 — Optimizer Control (HH22AG110)

INTRODUCTION

Usage — Install the Optimizer Control (Fig. 1) with Model 38CQ, HQ or RQ split system heat pump that has been added to standard oil or gas furnace. This Optimizer system provides cooling as required and heating season operation that maximizes system usage and benefits.

Optimizer usage is also beneficial in some heat pump/electric furnace systems such as those with Model 40ES. These Optimizer systems operate the same as gas or oil furnace/heat pump systems.

→ CAUTION: If annual snowfall is over 20 in. (508 mm), the minimum setpoint of the Optimizer Control is 35 F (1.6 C).

OPTIMIZER SYSTEM INSTALLATION REQUIREMENTS

→**Indoor Airflow Capacity** of furnace fan and duct system, as is, or with modification, must be approximately 400 to 500 cfm per 12,000 Btuh (189 to 236 l/s per 3.5 kW) of heat pump cooling capacity (equivalent to 33 to 42 cfm per 1,000 Btuh [15.6 to 19.8 l/s per .3 kW]). Determine existing system cfm capability (without indoor coil installed) by standard temperature rise or pressure drop methods. Calculate permissible cooling capacity.

Example:

System cfm capability = 1176 cfm (555 l/s)

Maximum heat pump cooling capacity permissible at 1176 cfm (555 l/s) with minimum requirement of 400 cfm (189 l/s)/12,000 Btuh (3.5 kW):

$$\frac{1176}{400} \times 12{,}000 \text{ Btuh} = 35{,}280 \text{ Btuh}$$

$$\frac{55}{189} \times 3.5 \text{ kW} = 10.2 \text{ kW}$$

With indoor coil installed, a larger furnace motor or blower assembly may be required. After installing coil, recheck cfm, and modify blower assembly or duct system as required.

RECOMMENDED INDOOR COIL LOCATION is on supply air side of gas or oil furnace, supply or return air side of Electric Furnace (40ES). See Fig. 2 and *Coil Installation Instructions.*

SYSTEM INDOOR THERMOSTAT — Use thermostat-subbase package 38CQ900-111 for manual cooling/heating changeover; 38CQ900-081 for automatic cooling/heating changeover. Required thermostat has manually operated emergency heat switch which locks out heat pump and activates furnace.

SYSTEM TRANSFORMER (24-v) CAPACITY required for most Optimizer systems is 60 va. Replace gas or electric furnace transformer as required with 60-va transformer, Carrier Part No. HT01AW230.

If oil furnace has a 40-va (or less) transformer, and accessory humidifier or air cleaner is wired in system, add another transformer to system to acquire 60-va total transformer capacity. Connect additional transformer in parallel and in phase with existing transformer as follows:

1. Connect 115-volt primary leads on 20-va transformer to same points as primary leads on existing transformer.
2. Attach one 24-volt secondary lead from 20-va transformer to furnace terminal C or common side of existing transformer.
3. Apply 115-volt power. Measure voltage between unconnected 24-v lead, on 20-va transformer, and terminal R on furnace. If voltage is zero, connect 24-v lead to terminal R. (Transformers are in phase.) If 50 volts (approximately) is measured, reverse 115-v primary lead connection on one transformer. Recheck voltage — if zero, connect 24-v lead to terminal R.

FURNACE FAN RELAY is required. Add to furnace when not so equipped. Furnaces shown in Control Circuit Connections, Fig. 3, have fan relay.

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OPTIMIZER CONTROL INSTALLATION

A 5-ft (1.5 m) capillary tube connects the outdoor temperature sensing bulb to Optimizer body. Locate bulb outdoors behind the shade shield. Mount Optimizer indoors for easy accessibility, Fig. 2.

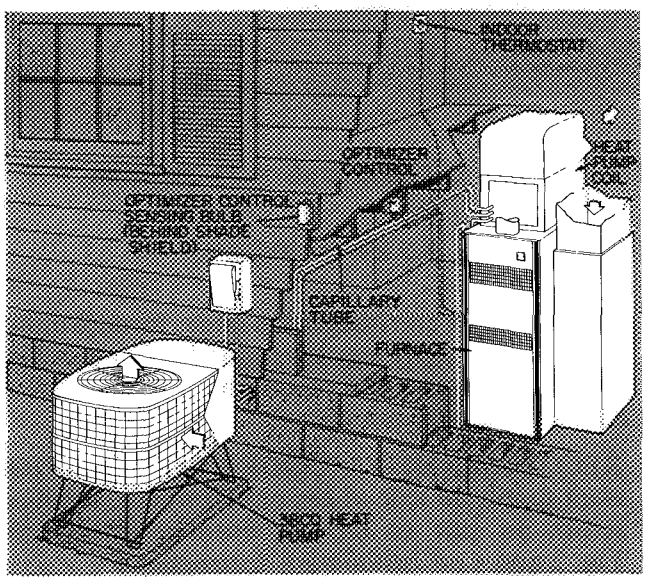


Fig. 2 — Typical Optimizer Installation

System Wiring Data (24 v)

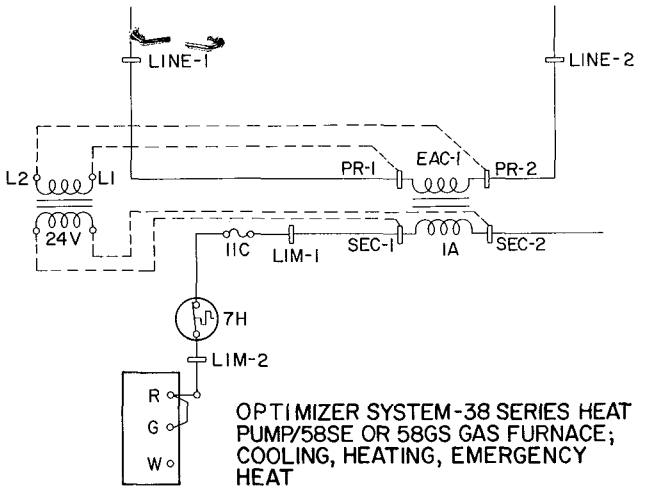
1. Connect Optimizer system control wiring, Fig. 3.
2. Furnace transformer supplies 24-v power for system.
3. Required indoor fan relay is energized thru terminal G, Fig. 3.
4. Electric furnace terminals R and C must be powered by transformer 24-v secondary; if not, change wiring.
5. For example of complete Optimizer system diagram, refer to heat pump wiring book.

Optimizer Control Settings

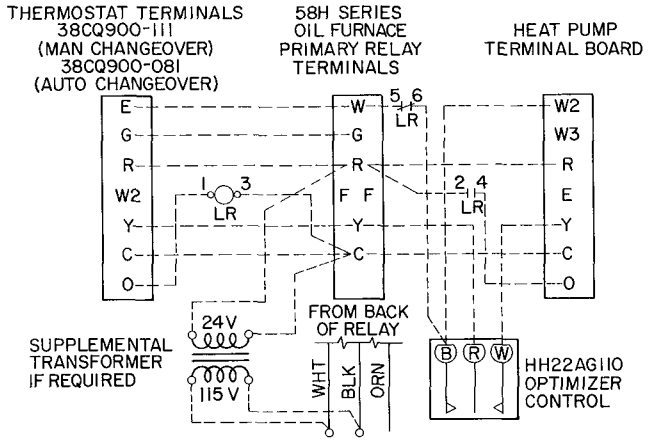
→1. Set Optimizer temperature dial to transfer heating function to furnace at a temperature equal to the calculated balance point plus the control differential setting (factory set at 10 F [-12.2 C]). Balance point is usually 30 F (-1.1 C) to 35 F (1.6 C). Calculation sheets are available from Carrier. Minimum setting is 20 F (-6.7 C).

2. Factory differential setting is 10 F (-12.2 C). In areas of less than 20 in. (508 mm) annual snow fall, setting can be readjusted to 5 F (-15 C). Remove Optimizer cover for access to differential adjustment wheel.

→ CAUTION: If the annual snowfall is over 20 in. (508 mm), the minimum setpoint of the optimizer control is 35 F (1.6 C).

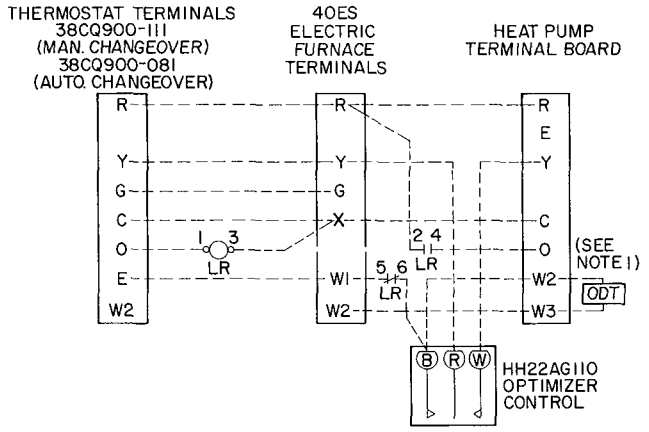


OPTIMIZER SYSTEM-38 SERIES HEAT PUMP/58SE OR 58GS GAS FURNACE; COOLING, HEATING, EMERGENCY HEAT



OPTIMIZER SYSTEM-38 SERIES HEAT PUMP/58H OIL FURNACE; COOLING, HEATING, EMERGENCY HEAT

CAUTION: The transformer's primary wires must be connected to the black and white relay wires as shown, since going to L1 and L2 would *bypass limit switches and make furnace operation unsafe*



OPTIMIZER SYSTEM-38 SERIES HEAT PUMP/40ES ELECTRIC FURNACE; COOLING, HEATING, EMERGENCY HEAT

LEGEND

Contacts 1 & 3 = Coil
Contacts 2 & 4 = Normally Open
Contacts 5 & 6 = Normally Closed
LR — Lockout Relay

NOTES: 1 Place outdoor thermostat across W2 and W3 to limit first stage "Strip" heat Use jumper wire if outdoor thermostat (ODT) is not used.
2 Use Carrier part no HK61KK324 relay or any pilot duty lockout relay (24 v) double-pole, single-throw with one normally open and one normally closed set of contacts

→ **Fig. 3 — Control Circuit Connections**

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Book	1	4
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Form 38CQ-17SIM Supersedes 38CQ-14SI Printed in U S A 5-80 PC 101 Catalog No 533-839